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Internal and External Factors in Effecting Third World Military Expenditures*

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Recent research on the determinants of Third World military expenditures has indicated that economic variables show great promise in providing a framework as to the underlying causes of Third World defense allocation decisions. Building on this research, we test the hypotheses that the level of military expenditures in developing countries is determined in large part by economic constraints relative to external (threat) factors. In general this hypothesis is borne out with the important qualification that countries without an arms industry appear relatively more affected by external factors than countries with an arms industry. The main implication of the analysis is that a reduction in Third World arms production would most likely result in lower overall levels of military expenditures in these countries.

1. *Introduction*

Currently the world is spending vast amounts of resources, both physical and human, on defense. Although in total the bulk of defense expenditures are accounted for by the industrialized countries, over the last twenty years military expenditures have grown more rapidly in the Third World than in the NATO or Warsaw Pact countries. The net effect of these trends is increased military burdens on a per capita basis or as the share of defense in total national income. The Third World is also the major market for weapons exported by the industrialized countries. For many developing countries, the surge in arms imports in the late 1970s and early 1980s has left a legacy of growth impairing external indebtedness (Looney, 1987a; Shubik & Bracken, 1983; Brzoska, 1983).

In 1973, the non-oil developing countries spent $28,518 million (in constant 1980 prices and exchange rates) on defense, while the OPEC countries allocated $15,707 million to military activities. By 1982, these figures had risen to $50,810 million and $52,903 million respectively. The Third World as a whole had doubled its total defense spending within ten years, a rate of growth far in excess of the major Western and Eastern alliances (SIPRI, 1986).

While these rates of growth have slowed down in recent years – the non-oil developing countries spent $60,174 million and the OPEC countries $54,624 million in 1985, there is still great concern over the tendency of developing nations to devote significant proportions of their national resources to non-developmental activities.

Because of the seriousness of these trends, there has been a rather dramatic increase in recent years of studies addressing either the causes or the consequences of Third World militarization. Here, analysis has been largely confined to five broad areas:

(1) studies of whether military spending helps or hinders economic growth;
(2) analysis of budgetary trade-offs between defense and socio-economic allocations;
(3) determination of the main factors that contribute to successful development of indigenous arms industries;
(4) identification of factors affecting the levels of arms transfers to the developing countries; and
(5) examination of the major determinants of the level of defense spending.

In large part, the bulk of the literature in this area stresses strategic-political variables

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as critical in affecting arms imports, and total military expeditures (external threats, alliances, regional arms races), budgetary priorities (military vs. civilian regimes), indigenous arms production (independence of major suppliers, emulation of neighbors, fear of arms boycotts by major suppliers). Economic analysis has played only a tangential role in analysis of the *determinants* of these variables (Alexander, Butz & Mihalka, 1981). Instead, most of the economically oriented approaches have been focused on the *impacts* of military expenditures, and, in particular, the effect of defense allocations on economic growth. A major conclusion of this work is that many Third World countries are likely to have sustained reductions in their growth as a result of increases in their military burdens (Chan, 1985, 1987).

Surprisingly little analysis has yet been attempted to answer the question as to why, if in fact military expenditures (and presumably arms imports and domestic arms production) retard growth, developing countries increase such allocations and activities even during periods of time when the resulting domestic strains may undermine political and social stability.

The present paper attempts to fill this gap in the literature by examining the extent to which economic conditions delineate a range in which the level of Third World military expenditures are likely to fall. In particular, we are interested in the role indigenous arms production plays in influencing the budgetary process and hence the overall level of defense expenditures in developing countries.

In contrast to the arms race literature, several recent studies (Harris, 1986; Maizels & Nissanke, 1986; Looney, 1986a, 1986c; Looney & Frederiksen, 1986a, 1988) have indicated that economic variables show great promise in providing a more accurate picture as to the underlying causes of Third World defense allocation decisions.

Building on this research, we hypothesize that economic variables play a major if not predominant role in setting ranges in which Third World military expenditures are likely to lie. This hypothesis is tested using cross section data for the period of the early 1980s.

2. *Assessment of Non-Economic Approaches*

In discussing the role which economic factors can play in affecting our understanding of the growth in Third World armaments, it is useful to begin by surveying several of the explanations stressing non-economic factors. Here, a fundamental distinction can be made between exogenous and endogenous models of military expenditures. The exogenous category includes those approaches which see national military expenditure patterns as essentially responses to external stimuli, in particular the actions of rival nations (but possibly also those of alliance partners). The endogenous category includes those approaches which see military expenditure patterns resulting largely from changing domestic considerations (Treddenick, 1985, p. 78).

With regard to exogenous theories, the popular and intuitively appealing metaphor of the 'arms race' has received the greatest attention in the literature. Nearly all arms race models trace their origin to the pioneering work of Lewis Richardson (1960). The well-known reaction equations developed by Richardson describe competitive armament acquisition in terms of the simultaneous linear differential equations, each equation depicting the rate of change of one nation's level of armaments as a positive function of the level of the rival nation's armaments and a negative function of its own.

While the Richardson and alliance models may provide useful descriptive devices, they strain credulity unreasonably to attribute their behavioral functions to the optimizing behavior of advanced industrial states, not alone Third World governments, most of which are neither seriously threatened by their neighbors, nor belong to formal military alliances. In any case it is expecting too much for the State to have the information and processing capacity to pursue grand optimizing strategies (Treddenick, 1985, p. 79).

Interestingly enough, despite the conceptual problems outlined above, almost all of the quantitative analyses of the impact of military expenditure on Third World economic growth have, with the notable exceptions of Deger & Smith (1983) and Deger

(1981), taken such expenditures as exogenously given.

3. *Review of the Economic Impact Literature*
One of the earliest attempts to quantify the relationship between military spending and economic growth was completed by Emile Benoit (1978). While Benoit tentatively found that defense spending and economic performance were positively correlated, no clear agreement has yet emerged, with some authors suggesting a positive role for defense budgets under certain conditions (Frederiksen & Looney, 1982, 1983, 1985), and others suggesting an overall negative effect (Ball, 1983).

Chan contends (1985, p. 434) that one of the main problems to date is the little effort devoted to identifying the direction of causality, i.e. does defense lead to growth or does economic growth allow nations to 'indulge in' more military programs – or both. However, this topic has also begun to receive some attention in the literature (Joerding, 1986; Frederiksen & LaCivita, 1987).

As noted at the beginning of this paper, little integration has taken place between the body of analysis focused on the defense/growth issue, and that dealing with defense/non-defense budgetary trade-offs. In part, one reason for the limited amount of research devoted to these issues probably stems from the fact that analysts examining large samples of developing countries are unlikely to find any particularly interesting linkages between defense and growth or between defense and non-defense budgetary categories (Vener, 1983).

Recently, however, Looney (1988b) found significant differences between arms and non-arms[2] producers in the manner that defense expenditures interacted with socio-economic allocations with non-producers tending to cut a disproportionate number of growth-enhancing allocations to accommodate expansions in the military budget. The net impact was one of increased military spending impacting negatively on growth.

In contrast, the arms producers as a group tended to avoid sharp cuts in growth-enhancing expenditures (with the exception of agriculture). Looney concluded that along Keynesian lines the multiplier linkages between increases in the defense burden and the private sector in arms-producing countries, might in the aggregate be sufficient to produce an increase in aggregate growth.

Apparently, the mere possession of a domestic arms industry places constraints on the budgetary process in arms-producing countries in a manner that is not present in non-arms-producing countries. The net effect is to skew allocations toward economic rather than social activities.

Drawing together several of these themes, an interesting pattern emerges:

(1) In general, resource unconstrained countries – defined largely in terms of exchange availability – appear to be capable of generating positive rates of economic growth with increased military expenditures. Conversely, increased allocations to defense in countries experiencing relative resource shortages tend to result in reduced rates of economic growth (Frederiksen & Looney, 1982, 1983, 1985).
(2) In addition, external debt accumulation also tended to increase growth in the unconstrained countries, but not in the constrained countries (Looney & Frederiksen, 1986b).
(3) Empirically, the most important factor differentiating Third World arms producers from non-producers is the relatively high degree of foreign exchange possessed by the producing countries. In essence, the producer countries are largely unconstrained and the non-producer countries are constrained (Looney & Frederiksen, 1987b, 1986c).

Based on their respective budgetary patterns and overall resource abundance, we would expect to find positive impacts on growth of increased military expenditures in the producer countries and negative impacts on growth in the non-producer countries.

To test this hypothesis a model along the lines of Looney & Frederiksen (1986b) was developed. Here the growth in real Gross Domestic Product (GDPGB) over the 1970–

82 period in the arms and non-arms-producing countries was assumed to be a function of the rate of growth in investment (GDIGB) from 1970–82; the average inflow of foreign resources as a percent of GNP (RBB) over the 1970–82 period; and the average military burden (military expenditures per capita, MEP) over the 1970–82 period. In addition, the rate of inflation (INFB) over the 1970–82 period was included to control for any influence price movements may have had on the overall expansion of the economy.[3]

The results:

Non-arms producers:

$$\begin{aligned} \text{GDPGB} &= 0.94\,\text{GDIGB} - 0.18\,\text{INFB} \\ &\quad (7.13) \qquad (-1.90) \\ &\quad - 0.57\,\text{MEP} - 0.07\,\text{RBB} \\ &\quad (-4.47) \qquad (-0.64) \\ r^2 &= 0.628;\ F = 17.33;\ \text{d.f.} = 45 \end{aligned}$$

Arms producers:

$$\begin{aligned} \text{GDPGB} &= 0.72\,\text{GDIGB} - 0.13\,\text{INFB} \\ &\quad (3.66) \qquad (-1.69) \\ &\quad + 0.32\,\text{MEP} - 0.38\,\text{RBB} \\ &\quad (2.89) \qquad (-2.46) \\ r^2 &= 0.525;\ F = 9.91;\ \text{d.f.} = 19 \end{aligned}$$

indicate that the military burden MEP had a strong negative impact on growth in the non-arms-producing group, and a statistically significant and positive impact on growth in the producing countries.[4]

As to an explanation of the factors responsible for these patterns, one can only speculate at this point. Perhaps in part the answer lies in the fact that, although far from vertically integrated through all phases of weapons production (Ayres, 1983), *ceteris paribus* the producing countries should be somewhat less dependent on imports of arms to maintain a given level of military expenditures. The lower import content per dollar of military expenditures should provide the arms producers with a stronger military expenditure income multiplier, and hence a more favorable impact on growth. One implication of these results is that governments in countries producing arms may not be as constrained as their counterparts in the non-arms-producing countries in increasing allocations to defense. Finally, the overall positive impact of the defense burden on growth suggests that given a desired level of security, it may be possible for the producing countries to divert orders from imported to domestically-produced arms to offset the deflationary impact of increased current account deficits (Looney & Frederiksen, 1987c).

The introduction to this paper posed the question as to why, if military expenditures do in fact retard growth, do developing countries increase such expenditures? Clearly, for the arms-producing countries the usual guns vs. butter dilemma may not be operative to nearly the extent it is in the non-producing countries. In any event, a logical case can be made based on the results above that the economic constraints on military expenditures in the arms-producing countries are likely to be somewhat less severe than in the case of the non-producers.

4. *Review of the Economic Determinants' Literature*

Recent interest has focused on the role of economic factors in effecting the overall level of military expenditures. Treddenick (1985) tested for the impact of economic variables on the recent pattern of Canadian military expenditures. Specifically he wished to see whether expenditures in Canada might be determined by 'domestic economic imperatives . . . independent of any security considerations' (p. 77). He concluded that 'recent large increases in Canadian defense expenditures have been influenced more by economic than by security considerations' (p. 78), and that change in military budgets has been a policy instrument used by the Canadian government.

Maizels & Nissanke (1986) conducted a cross-section study of 83 countries with average data from 1978–80. They hypothesized three potential determinants of military expenditures in any country – the political framework, military activity and economic linkages. However, the relative importance of each factor will be determined by national, regional or global conflicts or interactions in the individual country. For example, at the national level economic factors such as the level of economic development (urbanization, inequalities in wealth and income, and

opportunities for advancement), real income growth, the size of the budget, and the influence of the military-industrial complex are considered important determinants of military spending. At the global level, they considered the growth of foreign exchange, the influence of foreign capital and major aid donors to be important determinants of military spending. After estimating regression equations for the entire sample and for three regions (Africa, Asia, and Latin America), they noted not only that complexity of factors, but that these factors would vary from country to country. They concluded that:

> Domestic factors, particularly the need perceived by ruling elites to repress international opposition groups, and external factors, including relations with the global power blocs and the availability of foreign exchanges to purchase arms from abroad, also appear to the major determinants of government decisions in regard to military expenditures (p. 1137).

Harris (1986) noted the little attention paid to the economic determinants of military spending levels in developing countries. In a time series analysis to verify the earlier findings of Ames & Goff (1975), he examined the importance of endogenous economic variables on defense spending levels in five ASEAN countries – Indonesia, Malaysia, Philippines, Singapore, and Thailand. The independent variables were GNP levels, government revenues, inflation rates and the balance of payments. Three dependent variables were examined: defense as a percent of (a) GNP and (b) central governments, and the levels of defense spending. In addition, Harris tested for the presence of some sort of lag structure by regressing the dependent variables against the previous years' value of the independent variables. He concluded that:

> . . . economic conditions, especially government current revenue, appear to exert at least a moderate influence on annual changes in defense expenditure in ASEAN . . . A nation's GNP sets a broad limit on its domestically-financed defense expenditure, and that defense expenditure in the previous year is a good indicator of its level in the next year (p. 41).

Harris also noted that the balance of payments was an indirect effect through government revenues and that cutting defense expenditures might be relatively difficult given its high personnel component.

In their time series examination of ten Latin American countries, Looney & Frederiksen (1987a) found that

> . . . a large proportion of variability in defense expenditures can be explained by economic variables: the overall constraint (GDP) and fiscal funding variables (primarily government expenditures, but in two cases government revenues) . . . the results (also) suggest that the regions' superpowers might have a somewhat different set of fiscal linkages than the smaller countries (p. 21).

5. *Implications for the Present Study*

The literature reviewed above has a number of implications for the present study:

(1) In contrast to the non-economic approaches to military expenditures, the economic explanations explicitly take into account the budgetary constraints on ruling elites.
(2) Implicit in the economic approach is the notion of an optimal stock of military assets (and hence security) in developing countries. This optimal stock is, in turn, largely a function of perceived or imagined threats to the ruling class.
(3) The economic and non-economic approaches to military expenditures can be linked with the assumption that the optimal level of military expenditures is exogenous with the actual level of allocations to defense undertaken to bridge the gap between existing levels of security and those deemed optimal.
(4) The speed of adjustment between actual and optimal levels of security which determines the annual level of military expenditures can, in turn, be taken as a function of the economic resources at the disposal of the elites and the economic constraints under which they must operate.
(5) Elites will mobilize additional resources for their survival as the degree of threat increases, but the overall economic conditions will delineate the boundaries within which this mobilization can take

place (Maizels & Nissanke, 1986; Whynes, 1979, ch. 2).

6. *Economic Determinants of Defense Expenditures*

The economic literature is suggestive of a number of variables that are likely to affect the overall level of defense expenditures in developing countries.

First, as noted above, the gross domestic product is a relevant factor since, in a general way, national income delineates the overall ability of a country to maintain a particular volume of military expenditure (O'Leary & Coplin, 1975).

Second, the balance of payments deficit is also relevant, since again in a general way this variable delineates the volume of external resources that may be used to finance imports. A related factor is the size of the external public debt, some of which has undoubtedly gone to financing past military expenditures. At any point in time, additional debt can be used to finance increased arms imports. On the other hand, for some countries the outstanding debt may in reducing their credit worthiness serve as a constraint to further arms imports.

Third, the military burden (defined as military expenditures per capita or military expenditures as a share of GDP) may also influence the level of military expenditures in the sense that richer countries *ceteris paribus* are also likely to devote a larger proportion of their budgets to defense. This is the so-called Wagner's Law effect (Thorn, 1967).

Fourth, there is evidence that mineral-exporting countries have different patterns of military expenditures than do their non-mineral counterparts (Looney, 1987c).

Fifth, as noted above, the possession or not of an indigenous arms industry may influence the pattern of military expenditures, trade-offs with other budgetary items, and arms imports.

Based on the empirical studies summarized above, it is possible to formulate a number of hypotheses concerning the likely influence of economic environments and factors on the defense allocation process:

(1) Since the non-producers are in large part resource constrained countries (Looney & Frederiksen, 1986c), arms imports for this group of countries should be positively associated with the overall level of imports. Here, for example, an increased ability to finance imports stemming from increased export earnings would tend to alleviate the foreign exchange constraint, facilitating increased imports in all areas, including arms imports.

(2) Similarly, arms imports of the non-producers would be expected to increase with the balance of payments deficit – the ability to run higher deficits could be used to import additional arms.

(3) On the other hand, given the low borrowing capacity of the non-producers (Looney, 1987a), public external debt could probably not be used to finance additional arms imports (hence we should expect a negative sign on this term).

(4) Due to their relative shortage of foreign exchange, it is likely that non-producers will be faced with more severe budgetary trade-offs than their producer counterparts. Given the relatively high foreign exchange components in health programs, we might anticipate a negative relationship between allocations to this activity and arms imports. Due to its much higher local currency content, however, this relationship does not appear to hold for total military expenditures (Looney, 1988b, 1986b).

(5) For the producer countries, we might expect that arms imports would be linked fairly closely to total military expenditures. Given the need for imported parts and components to maintain production runs, any expansion in overall military expenditures and arms production would translate itself into a fairly specific arms import requirement.

(6) Given the relative abundance of foreign exchange in the arms-producing countries, we would not anticipate any marked set of trade-offs between social and military expenditures.

(7) For total military expenditures, we would expect that both producers and non-producers would want to maintain some sort of ratio of military expenditures to overall resource availability, depicted for example by GNP. As noted above, however, we might expect that the non-producers would finance additional military expenditures with balance of payments deficits – since their export earnings and overall borrowing capacity are limited.

(8) Given their commitment to the production of armaments, we would expect the producers to have a more stable pattern of military expenditures over time. *Ceteris paribus*, the necessity of maintaining production runs during periods of low threat as well as times of increased tension should result in producing countries having a relatively stable ratio of military expenditures to gross national product. Furthermore, given their relatively higher levels of government revenues (Looney, 1988a), producers would also have more flexibility in expanding or contracting military expenditures to maintain this ratio.

(9) With respect to public external debt, we would expect it to be a function of GNP – the overall level of economic activity, reserves – the higher the level, the less need to borrow, exports – the higher the level the more credit-worthy the country and military expenditures (Looney, 1987a).

(10) Presumably the arms producers have better foreign exchange positions, and hence the option of borrowing to finance military expenditures if necessary. If the government feels that borrowing is necessary to keep production runs going, they would be more likely to borrow for military related activities than the non-producers.

(11) With regard to total imports, we would anticipate that the non-producers, not being able to produce weapons, would find it necessary to import most equipment – we would therefore expect to find a fairly close relationship between imports and military expenditures. This relationship should not be as strong for the producers who have the option to buy local equipment or imported equipment.

(12) Military expenditures as a share of GNP are likely to be much more stable in the producing countries than in the non-producing countries – due to the reasons discussed above. Given the need to maintain production runs, the governments in producer countries are more likely to borrow externally, increase taxes and or run larger government deficits to maintain overall levels of military expenditures (Looney & Frederiksen, 1987a).

(13) The share of defense in the budget would again probably be more stable for the producers than for the non-producers. The process of indigenous production sets up a stream of required arms imports to maintain production runs. We would expect a fairly close relationship between arms imports and the share of the budget for defense in the producing countries. Given their relatively unconstrained situation, there should be no major trade-offs with social programs such as education.

(14) The literature seems to suggest that mineral (including oil economies) may use their additional revenue for social programs – public works and the like after meeting some target level of defense expenditures. We would expect therefore that mineral[5] economies, everything else being equal, would have lower shares of their budget allocated to defense (Looney, 1987b).

(15) Following Weede (1986, pp. 299–300), the external threat component of military expenditures is proxied by the military participation ratio, the proportion of the population under arms.[6]

(16) Given the fact that non-producers will be more dependent on weapons imports for their mobilization, (which presumably can be more easily met out of existing weapons stocks in the producing countries), we would expect increased threat to have a much more significant effect on these countries.

The producers probably have inventories of weapons from past production that can be used in a crisis.

7. *Empirical Tests*

It is clear from the above discussion that military expenditures, arms imports, the share of defense in the government's budget, total imports, and external debt are all interrelated. To capture these effects for the purpose of testing the sixteen hypotheses developed in the previous section, a small model was specified and estimated with a two-stage least squares regression technique.[7] The model[8] has six equations, and is designed to examine all facets of military expenditures: arms imports, total military expenditures, military expenditures as a share of GNP, and the share of defense expenditures in the government budget.

The two links with the macroeconomic environment, and ultimately having impacts on growth, are the level of imports, a leakage from the income stream and hence tending to reduce growth, and the level of public external debt, shown to increase growth in non-constrained countries (Looney & Frederiksen, 1986b). To determine the relative impact of internal (economic) and external (threat) forces in effecting military expenditures, two sets of equations were estimated. The first with only economic variables, and a second with the proxy for external threat – armed forces per 1000 population, 1980 (AFP) included.

8. *Empirical Results*

8.1 *Omission of External Threat*

Two Stage Least Squares Estimates (standardized regression coefficients)

Public External Debt (PDB)

(total country sample)

(1) PDB = 0.90 GNP − 0.29 GIRB + 0.35 TE + 0.13 MEY
(14.31) (−3.77) (4.29) (3.00)
$r^2 = 0.934$; d.f. = 37

(arms producers)

(1′) PDB = 0.94 GNP − 0.27 GIRB + 0.31 TE + 0.20 MEY
(11.50) (−3.06) (3.26) (3.02)
$r^2 = 0.947$; d.f. = 16

(non-producers)

(1″) PDB = 0.63 GNP − 0.30 GIRB + 0.47 TE + 0.07 MEY
(3.78) (−1.76) (2.32) (0.57)
$r^2 = 0.760$; d.f. = 20

Share of Defense Expenditures in Central Government Budget (GEDB)

(total sample)

(2) GEDB = 0.70 AI + 0.12 GEEB − 0.22 Mineral
(4.92) (0.86) (−1.55)
$r^2 = 0.492$; d.f. = 37

(arms producers)

(2′) GEDB = 0.83 AI + 0.41 GEEB − 0.45 Mineral
(6.34) (2.90) (−3.33)
$r^2 = 0.802$; d.f. = 16

(non-producers)

(2″) GEDB = 0.60 AI − 0.06 GEEB + 0.15 Mineral
(2.93) (−0.31) (0.77)

Arms Imports (AI)

(total sample)

(3) $AI = 1.05\,ME - 0.19\,CAB - 0.42\,PDB - 0.29\,TI + 0.04\,SH$
(5.57) (−0.76) (−1.27) (−1.36) (0.22)
$r^2 = 0.519$; d.f. = 37

(arms producers)

(3′) $AI = 0.94\,ME + 0.20\,CAB + 0.01\,PDB - 0.17\,TI + 0.04\,SH$
(7.10) (0.99) (0.06) (−1.16) (0.22)
$r^2 = 0.844$; d.f. = 16

(non-producers)

(3″) $AI = 0.81\,ME - 0.14\,CAB - 0.37\,PDB + 0.90\,TI - 0.87\,SH$
(4.12) (−1.56) (−2.03) (3.33) (−3.38)
$r^2 = 0.931$; d.f. = 20

Military Expenditures (ME)

(total sample)

(4) $ME = 0.46\,MEY + 0.56\,GNP - 0.13\,BI$
(3.64) (4.61) (−1.03)
$r^2 = 0.523$; d.f. = 37

(arms producers)

(4′) $ME = 0.62\,MEY + 0.47\,GNP - 0.02\,BI$
(2.78) (2.23) (−1.12)
$r^2 = 0.460$; d.f. = 16

(non-producers)

(4″) $ME = 0.14\,MEY + 0.34\,GNP - 0.36\,BI$
(0.97) (2.26) (−3.16)
$r^2 = 0.883$; d.f. = 20

Total Imports (TI)

(total sample)

(5) $TI = 0.80\,TE + 0.26\,ME - 0.23\,PDB - 0.34\,CAB$
(10.48) (3.76) (−1.95) (−3.60)
$r^2 = 0.914$; d.f. = 37

(arms producers)

(5′) $TI = 0.90\,TE + 0.17\,ME - 0.37\,PDB - 0.51\,CAB$
(6.53) (1.58) (−1.62) (2.72)
$r^2 = 0.873$; d.f. = 16

(non-producers)

(5″) $TI = 0.47\,TE + 0.50\,ME + 0.12\,PDB - 0.02\,CAB$
(6.38) (6.54) (1.47) (−0.23)
$r^2 = 0.958$; d.f. = 20

Military Burden (Military Expenditures/Gross National Product (MEY))

(total sample)

(6) $MEY = 0.02\,PDPB + 0.80\,GEDB - 0.20\,GDB + 0.23\,RTCRYB$
(0.16) (7.52) (−1.76) (2.32)
$r^2 = 0.723$; d.f. = 37

(arms producers)

(6′) $MEY = 0.13\,PDPB + 0.56\,GEDB - 0.15\,GDB + 0.41\,RTCRYB$
(1.36) (7.74) (−1.84) (5.46)
$r^2 = 0.955$; d.f. = 16

(non-producers)

(6″) MEY = −0.01 PDPB + 0.01 GEDB − 0.01 GDB + 0.01 RTCRYB
(−0.21) (5.17) (−1.04) (1.45)
r^2 = 0.661; d.f. = 20

8.2 *With External Threat*

Share of Defense Expenditures in Central Government Budget

(total sample)

(7) GEDB = 0.33 AI + 0.07 GEEB − 0.11 Mineral + 0.56 AFP
(2.31) (0.65) (−0.91) (4.19)
r^2 = 0.627; d.f. = 37

(producers)

(7′) GEDB = 0.68 AI + 0.32 GEEB − 0.38 Mineral + 0.23 AFP
(4.32) (2.22) (−2.83) (1.55)
r^2 = 0.835; d.f. = 16

(non-producers)

(7″) GEDB = −0.01 AI + 0.15 GEEB + 0.16 Mineral + 0.86 AFP
(−0.05) (0.95) (1.07) (3.69)
r^2 = 0.722; d.f. = 20

Military expenditures

(total sample)

(8) ME = 0.16 MEY + 0.55 GNP − 0.07 BI + 0.36 AFP
(0.63) (4.60) (−0.53) (1.37)
r^2 = 0.551; d.f. = 37

(producers)

(8′) ME = 1.33 MEY + 0.43 GNP − 0.13 BI − 0.79 AFP
(2.10) (2.06) (−0.58) (−1.12)
r^2 = 0.518; d.f. = 16

(non-producers)

(8″) ME = −0.19 MEY + 0.30 GNP − 0.51 BI + 0.45 AFP
(1.23) (2.41) (−3.26) (3.27)
r^2 = 0.933; d.f. = 20

Arms imports

(total sample)

(9) AI = 0.71 ME − 0.10 CAB − 0.14 PDB − 0.38 TI + 0.07 SH + 0.47 AFP
(3.93) (−0.53) (−0.54) (−2.19) (0.48) (3.55)
r^2 = 0.678; d.f. = 37

(producers)

(9′) AI = 0.80 ME + 0.23 CAB + 0.15 PDB − 0.27 TI + 0.07 SH + 0.32 AFP
(7.43) (1.34) (0.60) (−2.22) (0.51) (3.05)
r^2 = 0.919; d.f. = 16

(non-producers)

(9″) AI = 0.35 ME − 0.11 CAB − 0.16 PDB + 0.72 TI − 0.67 SH + 0.44 AFP
(1.80) (−1.64) (−1.05) (3.46) (−3.38) (3.63)

9. *Implications of Results*

The results tend to confirm our assertions about the influence of economic factors and environments in Third World defense expenditures (points 1–16, above). It appears that a high proportion of the various measures of resources allocated to the military can be accounted for by internal (economic)

factors. On the other hand, non-producer environments are relatively more susceptible to external factors. Apparently, the possession of an indigenous arms industry places on-going demands to maintain relatively high (and stable) levels of defense expenditures. The governments of non-producing countries may not face the same political pressures to maintain high levels of defense expenditures during periods of low external threat simply to maintain employment in defense plants.

In terms of the implications for demilitarization, it is apparent that the advanced countries might be able to significantly reduce Third World military expenditures through pursuing a much more strict control of the licensing of arms production technology, and in the restriction of financial credits to build additional plants.

In addition, the producing countries appear to finance a large part of their military expenditures with external debt (equations 1′, 1″), and therefore are not necessarily shifting domestic resources away from productive activities to produce arms. Tighter controls over foreign lending to these countries would undoubtedly make arms production somewhat less attractive.

In sum, it is the contention of this paper that analysis of Third World military expenditures that emphasizes arms race dynamics and/or threat factors has tended to ignore the national and international economic factors that influence a nation's choice to buy, sell or produce arms. Lacking an inclusion of the economic incentives that are motivating in most countries, these models often predict that countries scale down defense expenditures during periods of relatively low external tensions. The major build-up of defense expenditures in the late 1970s and early 1980s in many peaceful areas of the world clearly calls this framework into question.

On the other hand, models of military expenditure of the type developed above are clearly not substitutes for many of the more traditional approaches. Instead the inclusion of a systematic framework of economic constraints should complement this research already done on arms transfers, and provide an additional tool for assessing policies to regulate that market.

NOTES

1. This period was chosen largely due to the fact that it comes before the Third World debt crisis (1982), but after the second OPEC oil price increase (1978/79) had had some time to work itself out. As such, this period probably represents the culmination of forces that were put in motion by the first oil price increases (1973/74) and the subsequent wave of commercial bank lending to the Third World.
2. Unfortunately, we do not have a consistent measure of the size of indigenous arms industries across countries. In order to integrate this important factor into the analysis that follows we followed Neuman's (1984) criteria of classifying countries as producers if they were capable of producing at least one major weapons system. For purposes of this study the arms producers consisted of: Argentina, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Egypt, India, Indonesia, Israel, South Korea, Malaysia, Mexico, Nigeria, Pakistan, Peru, Philippines, Singapore, Sri Lanka, Thailand, and Venezuela.
3. Economic data are from the World Bank (1983, 1984, 1985, 1986). Military expenditures are from the United States Arms Control and Disarmament Agency (1987).
4. Since the resource balance is negative for net capital inflows, a negative coefficient for this term indicates that foreign resources have a positive impact on growth. The capital inflow term is therefore similar to the foreign aid variable originally used by Benoit.
5. A mineral economy is defined as one with over 40% of its merchandise exports in the form of minerals or oil (Looney & Knouse, 1987). In the regressions below (equations 7, 7′ and 7″), MINERAL is a dummy with 0 for non-mineral and 1 for mineral economies. A negative sign on this term would indicate that our hypothesis is correct.
6. While this variable is not ideal, it is hard to think of another index that would have universal validity in reflecting the manner in which Third World countries as a whole respond to threats. On the other hand, given the fact that the economic variables used in this study undoubtedly depict more accurately the underlying budgetary constraints facing governments, there will be an unavoidable bias, downgrading the importance of external

factors in effecting Third World military expenditures.

7. The rationale for this procedure is given in Pindyck & Rubinfeld (1976).
8. The variables are PDB, the level of public external debt, 1981; GNP, gross national product, 1981; TE, total exports, 1981; MEY, the share of military expenditures in Gross National Product (1981, dependent variable, 1980, independent variable); GIRB, the level of international reserves held by the country, 1981; GEDB, the share of defense in the central government budget, 1981; AI, arms imports, 1981; GEEB, the share of education in the central government budget, 1981; ME, total military expenditures, 1981; CAB, the current account balance, 1981; BI, the trade balance, 1981; SH, health expenditures, 1981; PDPB, ratio of external debt to Gross National Product, 1981; GDB, the government deficit share of Gross Domestic Product, 1981; RTCRYB, the ratio of government revenues to Gross National Product, 1981; AFP, armed forces per 1000 population, 1980.

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